GEOLOGIC CROSS SECTION 2K – WINKLER BOTANICAL PRESERVE

Cross section 2K begins at Dowden Terrace and runs east across Winkler Botanical Preserve to Varsity Park, ending at the summit of the natural area at 5325 Polk St. Several geotechnical boring sites and exposures along the route are identified by labels and symbols in the cross section. The specific location of the cross section is indicated on Plate 1 by a turquoise section line.

The cross sections are designed to be used together with the geologic maps, particularly Plate 5, to illustrate the third dimension of the map units. Contacts between map units are approximately located; the abundance of control points (surface exposures, wells, geotechnical sites) along the cross section provides a general indication of the reliability of contact locations. In this case, several closely spaced geotechnical sites and extensive natural exposures provide good control on the subsurface geology. Map units are depicted using the same colors, patterns, and labels as on Plate 5, and the explanation of map units on Plate 5 serves as the legend.

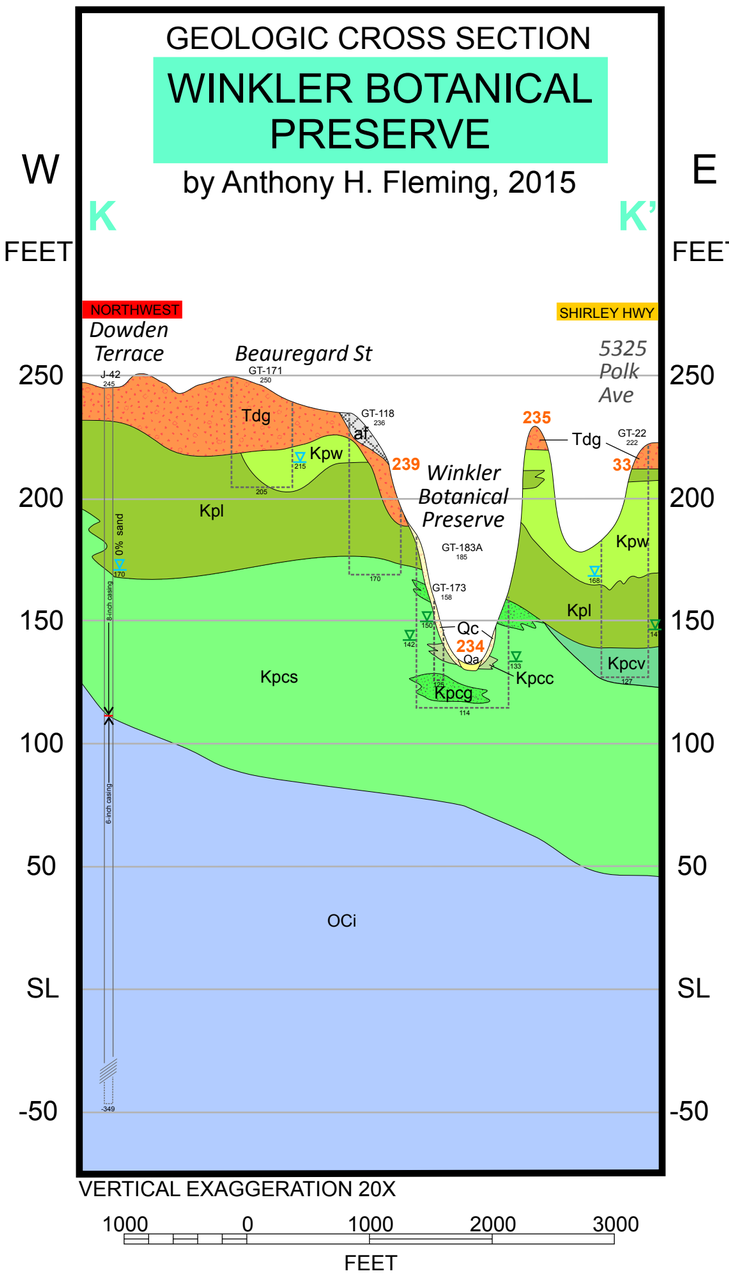
The dominant physiographic feature visible in the section is the deeply entrenched ravine at Winkler Botanical Preserve, which has cut through Dowden terrace to expose the lower part of the Potomac Formation. The type locality of the Winkler sand is the “fin” at exposure #235, which is characterized by steep, sandy slopes and forest species typical of acidic Potomac Formation sands. The Winkler sand forms a northeast-trending, channel-like body that parallels Shirley Highway. It is up to 50 feet thick at the preserve. Prior to 2014, the Lincolnia silty clay was well exposed in the streambed higher in the preserve, but the exposures have since been destroyed by streambank rip rap.

Geotechnical borings at site #118 reveal part of a deep, gravel-filled late Tertiary river channel at the base of the Dowden terrace, where the upland gravel is cut deeply into the Potomac Formation (the rest of the channel was eroded away when the modern Winkler ravine was cut during the Ice Age). A similarly deep channel at the base of the Dowden terrace occurs at the nearby Seminary Road interchange with Shirley Highway, and it is tempting to think they are the same feature, as suggested by the arrow on plate 5. Slopes throughout the preserve are thickly mantled by coarse-textured colluvium derived from the retreating edge of the terrace gravel and the Winkler sand, producing a rather well drained, acidic soil at many places. The perennial stream in this ravine is fed by a respectable volume of ground water discharging from both the terrace gravel, the Winkler sand, and the Cameron Valley sand.

GEOLOGIC CROSS SECTION

WINKLER BOTANICAL PRESERVE

by Anthony H. Fleming, 2015



VERTICAL EXAGGERATION 20X

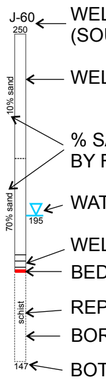
1000 0 1000 2000 3000

FEET

EXPLANATION OF CROSS SECTION SYMBOLS:

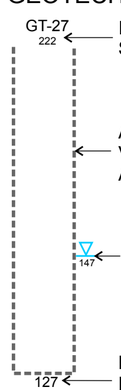
SEE PLATE 5 FOR EXPLANATION OF MAP UNITS

WATER WELL



- WELL ID NUMBER AND SURFACE ELEVATION (SOURCE: J-JOHNSTON; D-DARTON; F-FROELICH)
- WELL CASING
- % SAND IN 100-FT INTERVAL REPORTED BY FROELICH (1985)
- WATER LEVEL
- WELL SCREEN
- BEDROCK SURFACE
- REPORTED BEDROCK LITHOLOGY
- BOREHOLE IN BEDROCK
- BOTTOM ELEVATION

GEOTECHNICAL BORING SITES



- ID NUMBER AND HIGHEST SURFACE ELEVATION
- APPROXIMATE LATERAL AND VERTICAL EXTENT OF SITE ALONG CROSS SECTION LINE
- WATER LEVEL
- BOTTOM ELEVATION OF DEEPEST BORING

WATER LEVELS REPORTED IN WELLS AND GEOTECHNICAL BORINGS

- 119 — WATER LEVEL MEASURED IN WELL OR CASED GEOTECHNICAL BORING COMPLETED IN THE CAMERON VALLEY SAND (LOWER AQUIFER OF THE POTOMAC FORMATION)
- 132 — WATER LEVEL MEASURED IN 1976 FROM WELL COMPLETED IN CAMERON VALLEY SAND (JOHNSTON AND LARSON, 1977)
- 210 — WATER LEVEL MEASURED IN WELL OR GEOTECHNICAL BORING COMPLETED IN OTHER AQUIFERS. MAY REPRESENT A COMPOSITE OR AVERAGE WATER LEVEL AT GEOTECHNICAL SITES WITH MANY BORINGS

OTHER SYMBOLS:

- 47 — SURFACE EXPOSURE. SOME EXCAVATIONS COINCIDE WITH GEOTECHNICAL BORING SITES
- SHIRLEY HWY — INTERSECTION WITH ANOTHER CROSS SECTION. CROSS SECTIONS ARE DISTINGUISHED BY NAME AND COLOR-CODED SECTION LINES AND TITLES